

Foot Injuries

Contributors

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Overview

Foot injuries can occur as a result of trauma or repetitive strain and therefore taking a key history and identifying the mechanism behind the injury is essential in differentiating the most likely causes. Most commonly foot injuries still allow for weight-bearing on that side, however, non-weight bearing injuries can have significant implications that are important to consider.¹ In sport, metatarsal fractures are relatively common and are typically caused in an acute situation either by a direct blow/trauma or by a twisting injury causing inversion or eversion forces. Fracture of the 5th metatarsal can present as an avulsion fracture (at base proximally), Jones fracture (break between base and middle) or a spiral fracture (most commonly in the neck). Stress fractures of Metatarsals are also common in sports with repetitive landing (running, jumping). These present with more gradual onset of pain and may be missed on X-ray. The 1st metatarsal phalangeal joint area (big toe) is often the commonest area that causes foot pain and may be osteoarthritis or joint inflammation. In younger athletes problems with the sesamoid bone (inflammation or stress fracture) can be problematic.

Plantar fasciitis is a more chronic soft tissue injury, which can be caused by prolonged standing commonly associated with change of footwear (commonly non supporting sandals or boots) or due to overuse secondary to unaccustomed exercise. Other risk factors include foot arch disorders and obesity. This causes a chronic degeneration of the plantar fascia at the origin on the calcaneus².

Case Studies

1) Mr Taylor is a 25-year-old man who works in an office. He was playing football for his local team at the weekend when an opposition player stood on the dorsum of his foot whilst making a tackle. Subsequently he developed pain in the lateral aspect of his right foot. He presented to the Accident and Emergency Department (A&E) unable to weight bear. He reported severe pain scoring 5/10 becoming a 9/10 on weight bearing on the visual analogue scale (VAS). Examination revealed swelling on the right dorsum of the foot with reduced range of dorsiflexion and plantar-flexion of the foot and big toe. X-ray showed a non-displaced avulsion fracture of the 5th metatarsal. He was discharged home with analgesia, crutches and an appointment to attend fracture clinic. He was managed conservatively with physiotherapy.

2) Mrs Robinson is a 37-year-old teacher who has recently joined a hockey team 5 weeks ago after a largely inactive summer holidays. She has started to develop a gradual pain and tenderness under her left heel. It is worse in the mornings and she says it 'stiffens up' after a period of being inactive. An X-ray showed no obvious fractures. She was diagnosed with plantar fasciitis. She was given a short-course of NSAIDs for analgesia, advice regarding loading, and she was advised to see orthotics for customised insoles.

Anatomy

The foot consists of 14 phalanges (5 distal, 4 middle and 3 proximal), 5 metatarsals and 7 tarsal bones. Every toe has a middle phalanx except the big toe. The tarsal bones consist of the talus, calcaneus, navicular, cuboid and 3 cuneiform bones (medial, intermediate and lateral). The plantar fascia overlies the first layer of the dorsal muscle of the foot.⁴

Aetiology

5th metatarsal fractures are relatively common injuries within contact or collision sports. Plantar fasciitis is the most common cause of heel pain most commonly occurring in the 3rd-5th decades, and associated with footwear.⁶

Clinical Features^{2,7,8,9}

	5 th Metatarsal Fracture	Plantar Fasciitis
Pain	• Sudden onset severe • Localised foot tenderness (global tenderness if associated injuries) • Worse when weight bearing	• Gradual onset • Localised at medial calcaneal tuberosity (shown below) • Worse in the mornings, after rest or when weight bearing
Inspection	Swelling at the foot, up to twice its normal size	---
Range of Movement (ROM)	Reduced passive and active ROM secondary to pain	Reduced dorsiflexion (due to stretching plantar fascia) and plantar-flexion ROM (secondary to pain)
Palpation	Tender lateral border of foot	Tender medial sole of heel/arch

Other differentials to consider are: gout, pseudogout, calcaneal fractures, Lisfranc injuries, navicular fractures and hallux rigidus.

Investigations¹⁰

5th metatarsal fracture: A foot x-ray shows this fracture clearly. Three images are normally taken: anteroposterior (front to back), oblique and lateral views. Weight bearing views can also be taken.¹¹

Plantar fasciitis: If the patient has relatively classical symptoms, imaging is not arranged. Bloods with regular inflammatory markers can be done to rule out any differentials. Plain x-ray can be used to rule out any bony causes of pain (note bone spurs on calcaneus are not relevant), while USS can help define the plantar fascia itself for more severe diagnosis such as plantar fascia rupture.

Management Options¹²

5th metatarsal fracture: Undisplaced 5th metatarsal fractures management involves ‘PRICE’ (protection rest, ice, compression & elevation), consideration of crutches or partial weight bearing boot for support, analgesia, and physiotherapy (promoting range of movement (ROM) exercises as tolerated). Displaced fractures, comminuted fractures, Jones fractures, or if there is associated neurovascular complication, should all be referred for an orthopaedic opinion.¹³

Plantar fasciitis: Plantar fasciitis is most commonly treated with non-operative conservative measures such as custom orthotics, soft heel pads, analgesia with NSAIDs, and eccentric exercises to increase ROM. Orthopaedic referral is required for more chronic cases lasting longer than 9 months and failing conservative measures.⁸

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